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ABSTRACT

Social facilitation can be defined as the effect of an audience or coactors on performance. Research on social facilitation effects has produced some contradictory and confusing findings. Some studies have found that the presence of others enhances performance; other studies have found that the presence of an audience or coactors impairs performance. Zajonc's theory of social facilitation is currently one of the most widely accepted interpretations of social facilitation effects. Zajonc's mechanistic drive model and Weiner's cognitive model offer competing explanations for the interaction between anxiety level and task performance. A 2 x 2 factorial design involving male college students (N=39) was used to test the two theories. The results tended to support Zajonc's model. As in Zajonc's theory, on the easy task subjects high in anxiety did better than subjects low in anxiety. On the difficult task subjects low in anxiety did better than subjects high in anxiety. This pattern of interaction is the exact opposite of that predicted by Weiner and clearly does not support his cognitive interpretation of social facilitation effects. (ABL)

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SOCIAL FACILITATION:
A TEST OF TWO THEORIES

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Abstract

High anxious individuals generally perform better than low anxious individuals on easy tasks. Conversely, low anxious individuals generally perform better than high anxious individuals on complex tasks. Zajonc's mechanistic drive model and Weiner's cognitive model offer competing explanations for this interaction. A 2 x 2 factorial design involving 39 male subjects tested between the two theories. The results tended to support Zajonc's model.

Introduction

Social facilitation can be defined as the effect of an audience or coactors on performance. The topic has a long history in psychology with the first experiment in social psychology being done in this area (Triplett, 1898). Since that time, research on social facilitation effects has produced some contradictory and confusing findings. Some studies found that the presence of others, either as an audience or as coactors, enhances performance; other studies found that the presence of an audience or coactors impairs performance (see Baron & Byrne, 1978; Pessin, 1933; Markus, 1978; Sanders, 1981).

No satisfactory explanation of these conflicting findings emerged until Zajonc (1965) applied Hullian drive theory to the results. He hypothesized that the presence of others leads to a state of heightened arousal or drive. Under conditions of arousal the tendency to perform the dominant response, the one with the greatest habit strength, is enhanced. When presented with a simple or familiar task, the chance of the dominant response being the correct response is high. Conversely, when presented with a complex or unfamiliar task, the chance of the dominant response being the correct response is low. Thus, if the dominant response is the correct response, as is more likely for a simple or familiar task, arousal enhances performance. However, if the dominant response is the incorrect response, as is more likely for a complex or unfamiliar task, arousal impairs performance. With this interpretation, Zajonc's theory seemed to simply and elegantly explain more than half a century of contradictory research.

In 1966, however, Weiner challenged Zajonc's model. Weiner hypothesized that cognition, and not a simple, mechanistic

stimulus-response relationship, is the mechanism mediating social facilitation effects. Specifically, he felt that people's cognitions about how they are doing on a task determines the outcome. In order to test his hypothesis, Weiner designed an ingenious study to reverse the findings predicted by Zajonc's model. In Weiner's study, high and low anxious male subjects were administered either an easy or difficult task. But, within this 2 x 2 design was a cognitive manipulation not present in prior studies. Using false normative feedback, the experimenter indicated to subjects working on the easy task that they were doing poorly. Conversely, subjects working on the difficult task were made to believe they were doing well.

Zajonc's theory would predict that subjects high in anxiety (drive) would do better than subjects low in anxiety on the easy task. Since subjects high in anxiety would be more likely to perform the dominant response, and since the dominant response on an easy task is more likely to be correct, high anxious subjects should do better on this task. Conversely, low anxious subjects should do better than high anxious subjects on the difficult task. Since the low anxiety (drive) group should be less likely to perform the dominant response, and since the dominant response on a difficult task is more likely to be incorrect, the low anxious group should do better than the high anxious group on this difficult task.

In contrast, Weiner (1966) predicted that the addition of cognitive information would reverse these predicted results. He argued that low anxious people are motivated by failure, while high anxious people are motivated by success. Therefore, by telling subjects performing the easy task that they are doing poorly, those low in anxiety (who are more motivated by failure) should do better

than subjects high in anxiety. Conversely, by telling subjects performing the difficult task that they are doing well, those high in anxiety (who are motivated by success) should do better than subjects low in anxiety. These predictions are exactly the opposite of those derived from Zajonc's model.

The results of Weiner's study supported his predictions. Subjects in the low anxious group did better than subjects in the high anxious group on the easy (failure) task. And, subjects in the high anxious group did better than subjects in the low anxious group on the difficult (success) task.

Zajonc's theory is currently one of the most widely accepted interpretations of social facilitation effects. However, the results of Weiner's experiment challenge this interpretation. Since Weiner's findings indicate serious inadequacies in Zajonc's theory, and since no test of Weiner's findings has ever been done, such a test forms the focus for the following study.

Method

Subjects

Thirty-nine subjects were selected from a volunteer group enrolled in introductory psychology classes. In following Weiner's (1966) procedures, the subjects were selected on the basis of two criteria: their scores on the Test Anxiety Questionnaire (Mandler & Sarason, 1956) and their sex. Only males scoring in the upper and lower thirds of the TAQ distribution were selected.

Apparatus

Subjects were individually tested using a paired-associate word list presented on a memory drum. There were three separate lists: practice, easy and complex. All subjects were presented the practice

list prior to receiving either the easy or complex list. These lists were identical to those used in Weiner's study.

In each list a stimulus word was paired with a response word which subjects had to memorize. The easy list consisted of fifteen pairs of words having a natural association with each other. For example, the words "wicked" and "evil" or "roving" and "nomad" have a natural association; they are synonymous and follow from each other. On the other hand, the twelve-pair, complex word list did not have any natural associations across the stimulus-response pairs. For example, "arid" and "grouchy" were a pair on this list. In addition, the complex word list contained natural associations between the stimulus words themselves. For example, the stimulus word "arid" was followed by the stimulus word "desert." Thus, the stimulus words further confused the subjects and made the complex task more difficult.

Procedure

The procedure closely followed that of Weiner (1966). Using a 2 x 2 factorial design, a neutral third party assigned high and low anxious subjects to either the easy or difficult word-association task. This allowed the experimenters to test individual subjects without knowing their anxiety classification. Each experimental session began by presenting the subject with a twelve-pair practice list. The purpose of this list was to familiarize the subject with the procedures and the apparatus. The practice list was presented to each subject for a total of six trials. At the conclusion of the trials a standard set of instructions was read to the subject.

> Starting on this trial the practice is over, and your performance does count. From now on your performance will be assessed and compared to the performance of other

> college students. We have found that people differ in their ability to learn this list, and that students who do well at this are able to perform well at a variety of other tasks. So your performance will be a good indicator of your general ability.
>
> Many students wonder how well they are doing on the list. So for your information, I will stop the machine every few trials and tell you how many mistakes (correct answers) you made and how well you are doing as compared to other college students.

After the instructions were read, either the easy or complex word list was introduced. In order to test between Weiner's and Zajonc's theories, the easy task was presented in a way to give the subsequent impression of failure; the complex task was presented in a way to give the subsequent impression of success. The introduction for the easy task was as follows.

> The average college student learned this list within four trials, so you should have little trouble mastering it.

While the experimenter told the subject that the list was learned in four trials, in actuality no one learned it in fewer than four trials. Following Weiner, this was done to help set up a failure experience for the easy task.

Conversely, the introduction for the complex task indicated that

> The average college student had great difficulty learning this list in thirty trials, so just try to do your best.

While the experimenter told the subject that no one learned the list in thirty trials, in actuality everyone learned it in less than thirty trials. This helped to set up a success experience for the complex task.

After the introduction, the subject was presented with either the easy or complex word list. Each stimulus word was presented for a two second duration. The subject was instructed to respond within

the two seconds and was then shown the correct response. The number of correct and incorrect responses, along with the number of trials needed to memorize the list were recorded.

During the presentation of the list, success or failure experiences were reinforced by the use of false normative feedback. At the end of every other trial the experimenter presented the subject with a false statement of his overall performance. For example, in the easy task, failure condition the experimenter said, "Most college students at this point are making only 1/2x as many mistakes." However, in the complex task, success condition the standard statement read, "Most college students at this point are making only 1/2x as many correct responses. Each of these false norms was used to reinforce the subject's perceived success or failure experience. Following Weiner, this procedure to manipulate success or failure continued until a criterion of two consecutive errorless trials, or thirty total trials, was reached.

After the subject completed the procedure, a post-test questionnaire was administered. Following the completion of the questionnaire the subject was thoroughly debriefed, being told the purpose of the study and the reason for the use of deception. The subject was then given the telephone numbers of the experimenter and the faculty supervisor in case any questions later arose.

Results and Conclusions

The data for analysis consisted of the mean number of trials for the subjects to reach criterion, i.e., two consecutive errorless trials. In addition, subjects' responses to the Test Anxiety Questionnaire (TAQ) and the post-test questionnaire were examined.

Even though high and low anxious subjects were selected from the

upper and lower thirds of the TAQ distribution, the degree of differentiation between the two groups was examined. The mean for the high anxious group was 34.17, while the mean for the low anxious group was 18.75. A t-test confirmed that the two groups were highly different from each other, $t(37) = 10.30$, $p < .001$.

The next item of analysis was the post-test questionnaire. It provided some indication of the the effectiveness of the success/failure manipulations. The questionnaire asked subjects how they perceived their task performance. The question was scaled from 1 to 7, with 1 indicating that they thought they had performed very well, and 7 indicating that they thought they had performed very poorly. Subjects in the complex task, success condition had a mean of 3.20, while subjects in the easy task, failure condition had a mean of 4.62. This separation was not as large as expected, but was still highly significant, $t(37) = 3.39$, $p < .002$. Thus, subjects in the complex task, success condition had a greater perception of success than subjects in the easy task, failure condition and vice versa.

Finally, to examine between Weiner and Zajonc's theories, the mean number of trials to criterion were subjected to a two-way analysis of variance. The results of the analysis were as follows.

Source	SS	DF	MS	F	Sig. F
Between Cells	328.36	3	---	---	
Task	269.92	1	269.92	14.69	.001
Anxiety	.61	1	.61	.03	.856
Anxiety x Task	57.83	1	57.83	3.15	.085
Within Cells	642.82	35	18.37		---
Total	970.18	38			

As can be seen, while the easy and difficult tasks resulted in significant differences in performance ($p < .001$), their interaction with the subjects' levels of anxiety was marginal ($p = .085$).

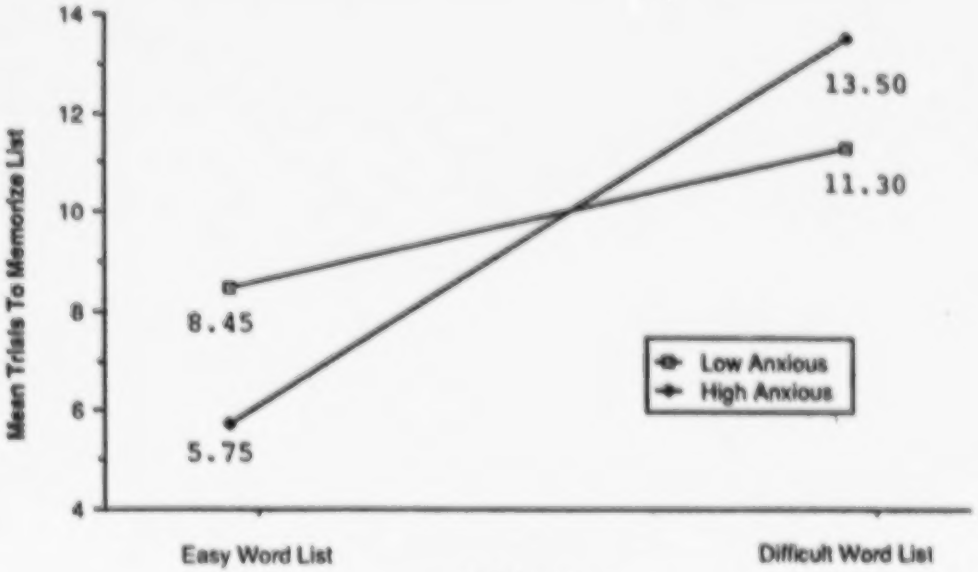

FIGURE 1

Performance On Word Lists

Despite the marginal level of significance, a closer examination of the cell means revealed an interesting pattern of results (see Figure 1). As Zajonc would have predicted, on the easy task subjects high in anxiety did better--i.e., had fewer trials to criterion (M = 5.75)--than subjects low in anxiety (M = 8.45). And, as Zajonc would have further predicted, on the difficult task subjects low in anxiety did better--i.e, had fewer trials to criterion (M = 11.30)--than subjects high in anxiety (M = 13.50). This pattern of interaction is the exact opposite of that predicted by Weiner and clearly does not support his cognitive interpretation of social facilitation effects. On the other hand, it offers continued support for Zajonc's more mechanistic drive model. Thus, Zajonc's model remains the more parsimonious and effective interpretation of social facilitation phenomenon.

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